

METHOD FOR FABRICATING A DEEP TRENCH CAPACITOR OF DRAM DEVICE

Abstract

A method for fabricating a deep trench capacitor of DRAM devices is disclosed. A substrate with a deep trench formed therein is provided. The trench is then doped to form a buried plate electrode serving as a first electrode of the deep trench capacitor at a lower portion of the deep trench. An isolation dielectric film is formed on interior surface of the deep trench. Subsequently, a first polysilicon layer is deposited on the isolation dielectric film to fill the deep trench. The first polysilicon layer is recessed to a first depth d_1 under the surface of the substrate. A thin silicon film is deposited on the recessed first polysilicon layer and also on the exposed isolation dielectric film. An anisotropic etching is carried out to etch the thin silicon film, the subjacent recessed first polysilicon layer to a second depth d_2 under the surface of the substrate. The remaining silicon film becomes a silicon spacer protecting the upper portion of the isolation dielectric film. The isolation dielectric film at the neck of the deep trench capacitor, which is not covered by the silicon spacer and the first polysilicon

layer, is stripped off to expose the substrate.